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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,517	08/26/2005	Esko Niemela	43315-216724	5769

26694 7590 09/27/2010

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EXAMINER	
OLSEN, LIN B	

ART UNIT	PAPER NUMBER
3661	

MAIL DATE	DELIVERY MODE
09/27/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,517	NIEMELA ET AL.	
	Examiner	Art Unit	
	LIN B. OLSEN	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-37,39,40,43 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *39,40 and 44* is/are allowed.

6)☐ Claim(s) *1-37 and 43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 April 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to the filing on September 13, 2010 of a response to the Final Office Action of May 12, 2010. The application currently contains 39 claims with claims 1, 21, 37, 39, 43 and 44 being independent.

Information Disclosure Statement

The information disclosure statement filed September 13, 2010 fails to comply with 37 CFR 1.97(d) because it lacks a statement as specified in 37 CFR 1.97(e). It would normally not be considered and the information therein would have only been placed in the application file unconsidered. However, in view of the withdrawal of finality of the last action (see below), the information disclosure statement has been entered and the information referred to therein has been considered.

Response to Amendment and Argument

The amendments to the claims have been entered.

The previous indicated allowability of claims 4 and 5 is withdrawn in view of the newly discovered reference(s) to U.S. Patent Pub. No. 2002/0192057 to Meulen, the information in the IDS of September 13, 2010 and the Examiner's more careful reading of the applicant's specification. Rejections based on these reference(s) follow. The finality of the previous action has been withdrawn and prosecution on the merits of this application is reopened on claims 1-3, 5-20, 21-37 and 43 which are considered unpatentable because their alleged allowability rests on the amendments that

incorporated the limitations of claim 4 into the independent claim of each claim string. Prosecution on the merits will be conducted on amended claims 39, 40 and 44.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **1-3, 5-9, 11, 14-16, 20-24, 26, 27, 32, 33 and 35-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2003/0060810 to Syrowicz et al. (Syrowicz) in view of applicants admitted prior art or in the alternative U.S. Patent Pub. No. 2002/0192057 to Meulen (Meulen). Syrowicz describes a method and apparatus for treating undesired presences on the skin of an individual using a robot arm to position a laser and camera mounted on the robot arm. A controller is positioned remote from the robot and communicates with a robot arm controller (RACU) and a laser/camera controller (LCU) wirelessly (as one alternative). Referring to Fig. 1 of Syrowicz, communication links 14 and 16 between the CPU 12 and the LCU 20 are wireless links as described in Para. 14. Communication link 18 between the CPU 12 and RACU 26 is similarly a wireless link as described in Para. 14. Laser 22 and camera 20 constitute the tool that is operatively connected to the robot arm 28 and is controlled through the LCU which is the control unit and communications module as also described in Para 14. RACU 26 is the robot controller which includes a robot control unit and communications module as also described in Para 14. CPU 12 and memory 46 constitute the supervisory controller of the system 10.

Meulen also describes a method of using a robot to position an article (a substrate) carried by the robot. While the end processing of these two disclosures are dissimilar (semiconductor processing and cosmetic procedures), the control constructs are similar with the hardware and software engineers implementing the methodologies requiring the same level of knowledge and experience. Referring to Meulen Fig. 2, a block diagram on the system, Host CPU 120 corresponds to the supervisory controller, communication links 112 correspond to wireless communications, System CPU corresponds to the control/communications unit, and the robot 40 corresponds to the tool. Meulen shows Load parts 116 as typical digital outputs and miscellaneous I/O devices 114 as performing other functions.

Applicant's specification at paragraph [0047] , states that "The I/O's may be industrial standard 24V using 4 ms filtering on the input side configured to communicate using standard RS232 or a standard Modular bus or another backplane bus. Aside from regular DO's there may also be additional visual (LED) quality indications of the radio-link status." This shows that configurable hardware input/output interfaces are well known in the industry.

Regarding independent **claim 1, A wireless controller for at least one of controlling or monitoring a tool operatively connected to an industrial robot, the controller comprising:** - See Syrowicz abstract.

a wireless communication module operatively connected to the tool and comprising a processor having a communication function module configured to handle wireless communication to and from said tool, - Syrowicz describes a

wireless link between the CPU and tool, inherent in a wireless link is a wireless communication facility to handle the wireless communication at each end of the link. **and a control unit configured to carry out at least one control function for one or more actuators of said tool;** - Syrowicz in Para. 15, it is stated that the laser can be actuated to treat the skin and in Para 14, control of a laser joint to position the laser and camera is described.

a configurable hardware input/output interface; and – Syrowicz does not particularly detail the component of the controllers that causes the robot arm to reposition the camera/laser nor the means to trigger the camera/laser. Applicant's specification at Para. [0047] describes a standard I/O that has been configured with filtering. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the standard I/O as described by the applicant to receive the sensors and control the actuators as was done but not detailed in Syrowicz because these known methods yield predictable results.

a supervisory controller physically separate from the industrial robot and configured to wirelessly send signals to the wireless communication module to control operation of the tool. - In Syrowicz CPU and Memory are shown separate from the robot arm and wireless links 14 and 16 send signals to the tool's wireless control capability.

Regarding **claim 2, The wireless controller according to claim 1, wherein the control unit comprises at least one computer program executable by said**

processor configured to handle the wireless communication. – In Syrowicz, LCU 20 contains a processor (see where LCU controls the movement of the laser using the laser joint 40 in Para. 14) that performs the functions inherent in wireless communications.

Regarding **claim 3, The wireless controller according to claim 1, wherein the control unit configured is further to process a signal from at least one sensor operatively connected to the tool.** - See Syrowicz, Para. 18, where camera (part of LCU) forwards visual information to CPU 12.

Regarding **claim 5, The wireless controller according to claim 1, wherein the hardware input/output interface is integrated in one unit with said processor.** – In applicant's acknowledged prior art, the I/O can share a backplane with the processor. Further in Meulen Para. [0025} LP 116 and Misc 114 are referred to a sub-components indicating that they are part of the system including processor 110.

Regarding **claim 6, The wireless controller according to claim 1, wherein the control unit further comprises a program configured to carry out at least one of receiving or storing operational data of said tool.** – See Syrowicz Para. 17 where camera produces image of 500 by 500 pixels.

Regarding **claim 7, The wireless controller according to claim 6, further comprising: a memory configured to store operational data.** – in Syrowicz, Memory 46

Regarding **claim 8, The wireless controller according to claim 6, wherein the control unit further comprises a computer program configured to process the operational data of said tool. –** See Syrowicz Para 18, camera processes visual information.

Regarding **claims 9 and 26, The wireless controller according to claim 6, wherein the control unit further comprises an output configured to communicate data dependent on the stored operational data to a display. .** – See Syrowicz, Background of invention where it is old technology in the art to connect visualization means (camera in this case) to a display for technician monitoring. Further note Para. [0021] where it is stated that a system technician can monitor the progress of the CPU 12 and make modifications to calibrate the system. It would have been obvious to one of ordinary skill in the art at the time of the invention to retain the old configuration with a display connected to the CPU 12 as means for the technician to monitor progress.

Regarding **claim 11, The wireless controller according to claim 9, wherein the output of the control unit is configured to communicate the stored operational data via the wireless communication module.** - In Syrowicz, since the retained

display would be connected to the CPU and the control unit communicates to the CPU through the wireless communications, the output of the control unit would travel through the wireless communication facility to reach the CPU.

Regarding **claim 14, The wireless controller according to claim 1, wherein the control unit further comprises a control loop configured to receive an input signal from a high level control system and to generate a control signal to said tool dependent on the input signal from the high level control system.** – Syrowicz Paras. 18 and 19 describe higher level processing done in the CPU, which leads in Para. 20 to where the higher level unit positions the laser and then sends an actuate command which causes the laser 22 to produce a laser beam 44 to perform treatment.

Regarding **claim 15, The wireless controller according to claim 14, wherein input/output signals of the control loop of the control unit are compatible with a high level language.** – The software described in Syrowicz paras. [0018] and [0019] is not stated to be written a high-level language, but tasks such as contour finding, analyzing colors, and using artificial intelligence are known to have high-level languages written to support them. It would have been obvious to one of ordinary skill in the art at the time of the invention to use high-level language to support these tasks which supply control signal s used in the control loop.

Regarding **claim 16, The wireless controller according to claim 6, further comprising: an additional processor configured to carry out at least one of receiving and storing operational data of said tool.** – Since the CPU 12 is not described in detail in Syrowicz, it would have been within the capabilities of a designer of such a system to use a multi-processor CPU to accomplish the tasks of either receiving or storing the operation data of the LCU.

Regarding **claim 20, The wireless controller according to claim 1, further comprising:**

a wireless input/output module configured to provide wireless I/O functions between the supervisory controller and said tool, wherein the wireless input/output module is arranged on or in relative proximity to the industrial robot. - The control unit of the Syrowicz LCU 20 supports wireless communications between the CPU and the LCU and is included in the LCU mounted to the robot.

Regarding independent **claims 21 and 37,** which are apparatus, method and computer product claims of the same entity, **A method for wireless at least one of control or monitoring of a tool operatively connected to an industrial robot, the method comprising:** - See Syrowicz abstract

configuring a configurable hardware input/output interface of a wireless controller, – Applicant's specification at Para. [0047] describes a standard I/O that has been configured with filtering. Syrowicz does not detail the means to control actuators or

receive sensors, but it would have been obvious to one of ordinary skill in the art at the time of the invention to use standard methodologies to accomplish this in order to be assured of predictable results.

sending a wireless signal from a supervisory controller physically separate from the industrial robot to a wireless communication module of the wireless controller operatively connected to said tool and configured to control operation of the tool, - In Syrowicz, CPU and Memory are shown separate from the robot arm and wireless links 14 and 16 send signals to the tool's wireless control capability.

handling wireless communication to and from the tool with a communication function module of a processor of the wireless communication module, - In Syrowicz, Fig. 1, wireless communication is conducted between CPU and a tool (the camera) through the LCU which handles the wireless communication.

carrying out at least one control function for one or more actuators of said tool with a control unit of the wireless communication module, - In Syrowicz, the LCU controls the tools (camera and laser) where actuators include snapping a picture and transferring the data back to the CPU.

receiving the signal with the wireless communication module, - In Syrowicz, when the LCU handles the wireless communication, it receives the signal.

processing the wireless signal in a processor of a control unit operatively connected to the wireless communication module, and - In Syrowicz, Para. 15, it is stated that the laser can be actuated to treat the skin and in Para 14, control of a laser

joint to position the laser and camera is described. Both of these actions originate from the processor in the LCU/RACU

generating a second control signal in the processor and sending the second control signal to said tool. – In Syrowicz, one set of control signals control the camera, while a second set control the laser.

Regarding **claim 22, The method according to claim 21, further comprising sending the second control signal with a hardware input/output interface of the wireless controller.** – Given that Syrowicz in the summary of the invention has identified the LCU/laser/camera as a subsystem that communicates with the supervisory controller wirelessly, focuses and takes images of a field of interest, and actuates the laser after it is positioned, it is inherent that the subsystem has a hardware interface between the LCU and the laser and camera and that unique control signals pass through this interface with the LCU.

Regarding **claim 23, The method according to claim 21, further comprising storing operational data for said tool in a memory of the wireless controller.** – Syrowicz Para. 18 reports that the specific points of interest for lasing are stored in memory 46.

Regarding **claim 24, The method according to claim 21, further comprising storing an in-signal and a result signal sent out in a memory of the wireless**

controller. - In Syrowicz Para. [0017] it is reported that a typical image is sent to the CPU for analyzing, so it must be stored in memory. As a result of computation each treatment position (defined in terms of position of joints 30_1, 30_2, 30_3, and 40 is stored in memory (Para. [0020]). This is the data sent out to control the positioning of the tool.

Regarding **claim 27, The method according to claim 21, further comprising providing diagnostic information based on an operational data.** –Syrowicz Para. [[0021] describes a technician monitoring the progress and making modifications to calibrate the system. Calibration is one action in diagnostics.

Regarding **claim 32, The method according to claim 21, further comprising:**

providing wireless input/output functions between the robot control system and the tool arranged on or in relative proximity to the industrial robot. . – In Syrowicz, the tool and its controller, the robot arm controller and the supervisory controller are all in wireless communications with each other.

Regarding **claim 33, The method according to claim 21, wherein the method carries out at least one of controlling and monitoring a tool arranged with an industrial robot to carry out the operation of any one from the list of: welding, soldering, riveting, painting, gluing, folding plate, bending plate, hemming plate, gripping an object, manipulating an object.** – In Syrowicz, by positioning the laser

and removing a surface feature from the object being scanned, the object is manipulated.

Regarding **claim 35, The method according to claim 21, wherein the wireless controller is operated by a human operator to carry out at least one of controlling and monitoring the tool.** – Syrowicz Para. 21 discusses the technician monitoring the progress of the CPU.

Regarding **claim 36, The method according to claim 21, wherein the wireless controller comprises a process running on one or more computers to carry out at least one of supervising and controlling the tool. –** As shown in Syrowicz Fig. 1, there are processors in the CPU 12, the RACU 26 and the LCU 20. The flow charts of Figs. 2 and 3 illustrate the processor or supervising and controlling the tool.

Claims **31 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Syrowicz/Meulen as applied to claims **21** above, and further in view of U.S. Patent Pub. No. 2004/0148058 to Johannessen et al. (Johannessen). Johannessen is concerned with wireless control of a robot manipulator from a portable operating unit and in particular with controlling multiple robot controllers with one operating unit.

Regarding **claims 31 and 34, The method according to claim 21, further comprising: downloading operational information and/or configuration data stored in the wireless controller to at least one of a second wireless controller or**

a second tool neither of which are mounted on the robot. - While Syrowicz Fig. 1 shows one supervisory controller supervising only one robot and tool and Meulen suggests that a Host CPU can control multiple systems controlled by a system CPU (Para. [0025], Johannessen in its Fig. 4 shows one base station 40 controlling six robots 3(a-f) with associated tools. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Johannessen's addressing technique to control more than one RACU/LCU from the supervisory controller

Claims **10, 12-13, 17-19, 25, 28-30 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Syrowicz/Meulen as applied to claims **1, 21 and 37** above, and further in view of U.S. Patent Pub. No. 2002/0173877 to Zweig and further in view of U.S. Patent Pub. No. 2004/0034448 to Siegers. Zweig is concerned with a mobile robotic device with both a web server and digital radio links. Siegers is concerned with using short ranged wireless service to communicate with a robotic tool in a semiconductor furnace.

Claims **10, 12-13, 17-19, 25, 28-30 and 43** each recite a feature of previous claims with the addition of a limitation on the messaging means, hardware wireless capability used, or protocol used in sending commands or data between the supervisory controller and the tool controller. The Examiner maintains that a choice of communications capability is well within the capabilities of one of ordinary skill in the art of computer controlled robots at the time of the invention. For instance, Siegers discusses communicating with the robot using a handheld device [0014]; in [0018]

Siegers says that the wireless transceiver used can be any device operable to send and receive data and applications using radio frequency signals, infrared signals or any other means of wireless communications. In [0019] Siegers discusses Bluetooth wireless standard and other 2.4 GHz band wireless capabilities; In [0030] use of other LAN standards such as 801.11b is mentioned; In [0033] use of JAVA applets to implement web servers is discussed; In [0035-36] use of TCP/IP protocol and remote method invocation is discussed and in [0037] serialization as a communication method is discussed. Sweig, in a similar area at the same time adds to this discussion of communication capabilities the IEEE 802.11 and 802.15 protocols (abstract); [0008] recites that programming techniques to increase the power and flexibility of the Internet had matured and a number of those newer programming techniques can be adapted to robotic control methods; In [0009] SGML, HTML, XML, XHTML use with Web pages is discussed and Paras. [0010-13] discuss various web interconnection strategies. In [0014] JAVA and web browsers are discussed; in [0027-0029] standard protocols such as PAN, HomeRF, SWAP, and Bluetooth™ are discussed. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the capabilities of the system described to incorporate the various communication facilities as claimed in the listed claims.

Allowable Subject Matter

Claims **39, 40 and 44** are allowed.

The following is an examiner's statement of reasons for allowance: The cited prior art neither teaches nor reasonably suggests that a graphical user interface for

carrying out controlling or monitoring a tool operatively connected to an industrial robot, should combine a graphical representation of a relevant production cell or part thereof with the operational data values that are displayed. Further the prior art does not suggest that operational data values displayed are arranged to be displayed upon activation of a part of the graphical representation of the relevant production cell or part thereof using a computer mouse, joystick, touch screen or similar computer display selection element. The industrial robot so monitored or controlled comprising a wireless controller comprising: a wireless communication module operatively connected to the tool and comprising a processor having a communication function module configured to handle wireless communication to and from said tool, and a control unit configured to carry out at least one control function for one or more actuators of said tool, and a supervisory controller physically separate from the industrial robot and configured to wirelessly send signals to the wireless communication module to control operation of the tool.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This art is listed in the form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin B Olsen/
Examiner, Art Unit 3661

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661